CLAIMS

What is claimed is:

1. A stent implantable within a vessel to support said vessel and ensure patency thereof, said stent comprising:

an elongated billet of polymer material, said billet being pre-drawn lengthwise and having a predetermined degree of lengthwise plastic strain; and

a lumen extending lengthwise through said billet.

2. A stent according to Claim 1, wherein said billet is expanded radially outwardly from said lumen to a predetermined degree of circumferential plastic strain.

3. A stent according to Claim 2, wherein said degree of said plastic strains are optimized to substantially maximize mechanical strength of said stent.

4. A stent according to Claim 1, wherein said polymer comprises a bio-absorbable compound.

5. A stent according to Claim 4, wherein said bio-absorbable compound is selected from the group consisting of polylactide, polyglycolide, polycaprolactone and tyrosine.

6. A stent according to Claim 4, further comprising a medicament distributed throughout said polymer.

7. A stent according to Claim 6, wherein said medicament is selected from the group consisting of Dexamethasone, Rapamycin, Taxol, Batimastat, 17beta-estradiol, heparin and phosphoricolyne.

8. A stent according to Claim 6, wherein said degree of plastic strains are optimized to substantially maximize release of said medicament from said stent.

9. A stent according to Claim 1, further comprising a radiopaque compound distributed throughout said polymer.

10. A stent according to Claim 9, wherein said radiopaque compound is selected from the group consisting of tantalum, zirconium, titanium, platinum, compounds including barium, compounds including bismuth and compounds including iodine.

11. A stent according to Claim 2, wherein said billet is heated during said radial expansion.

12. A stent according to claim 11, wherein said billet is heated to a temperature above the glass transition temperature of said polymer.

13. A stent according to Claim 2, wherein said radial expansion is effected after said billet is positioned within said vessel.

14. A stent according to Claim 1, wherein molecules comprising said polymer are oriented

lengthwise along said billet in response to said lengthwise plastic strain.

15. A stent according to Claim 2, wherein molecules comprising said polymer are oriented substantially circumferentially around said lumen in response to said circumferential plastic strain.

16. A stent according to Claim 1, wherein molecules comprising said polymer forming said billet are oriented substantially helically around said lumen.

17. A stent according to Claim 1, wherein molecules comprising said polymenr are oriented substantially helically around said lumen in response to said circumferential plastic strain.

18. A stent according to Claim 1, wherein said billet comprises a molded body.

19. A stent according to Claim 1, wherein said billet comprises a plurality of interlaced filamentary members.

20. A stent according to Claim 19, wherein said filamentary members are interlaced by a technique selected from the group consisting of braiding, weaving and knitting.

21. A stent according to Claim 1, wherein said billet comprises a single filamentary member biased into a helical shape.

22. A stent implantable within a vessel to support said vessel and ensure patency thereof, said stent comprising:

an elongated billet of polymer material, said billet having a first region, pre-drawn lengthwise to a first predetermined degree of lengthwise plastic strain, and a second region, pre-drawn lengthwise to a second predetermined degree of lengthwise plastic strain; and

a lumen extending lengthwise through said billet.

23. A stent according to Claim 22, wherein said billet is expanded radially outwardly from said lumen, said first region having a first predetermined degree of circumferential plastic strain, said second region having a second predetermined degree of circumferential plastic strain.

24. A stent according to Claim 22, wherein said plastic strains of one of said first and second regions are optimized to substantially maximize mechanical strength of said one region.

25. A stent according to Claim 23, wherein said polymer comprises a bio-absorbable compound.

26. A stent according to Claim 22, further comprising a first medicament distributed throughout said polymer comprising said first region.

27. A stent according to Claim 26, where said degree of said plastic strains in said first region is

optimized to substantially maximize release of said first medicament from said first region.

28. A stent according to Claim 26, further comprising a second medicament different from said first medicament distributed throughout said polymer comprising said second region.

29. A stent according to Claim 22, wherein a radiopaque marker is distributed throughout at least one of said first and second regions.

30. A stent according to Claim 22, wherein said first region is comprised of a material different from said second region.

31. A stent according to Claim 22, where said first and second regions are positioned adjacent to one another lengthwise along said billet.

32. A stent according to Claim 22, wherein said first region is positioned between said lumen and said second region.

33. A stent according to Claim 22, wherein said first and second regions are positioned circumferentially around said billet and extend radially outwardly from said lumen.

34. A stent according to Claim 22, wherein said billet further comprises a third region, pre-drawn lengthwise to a third predetermined degree of lengthwise plastic strain, said third region having a

third predetermined degree of circumferential plastic strain.

35. A stent according to Claim 34, wherein said third predetermined degree of plastic expansion of said third region is different from said degree of plastic expansion of both said first and second regions.

36. A stent according to Claim 34, wherein said third region further comprises a third compound distributed throughout said polymer comprising said third region.

37. A stent according to Claim 36, wherein said third compound comprises a medicament.

38. A stent according to Claim 36, wherein said third compound comprises a radiopaque marker.

39. A stent according to Claim 35, wherein said first, second and third regions are positioned adjacent to one another lengthwise along said billet with said second region positioned between said first and third regions.

40. A stent according to Claim 35, wherein said first, second and third regions are positioned in overlying relation circumferentially around said billet substantially surrounding said lumen, said second region being positioned between said first and third regions.

41. A stent according to Claim 35, wherein said first, second and third regions are positioned

circumferentially around said billet and extend radially outwardly from said lumen.

42. A method of making a stent implantable within a vessel to support said vessel and ensure patency thereof, said method comprising the steps of:

supplying an elongated billet formed of a polymer material;

drawing said billet lengthwise to establish a predetermined degree of lengthwise plastic strain; and

forming a lumen extending lengthwise along said billet.

43. A method according to Claim 42, further comprising the step of expanding said billet radially outwardly from said lumen to establish a predetermined degree of circumferential plastic strain therein.

44. A method according to Claim 43, further comprising the step of heating said billet during said radial expansion step.

45. A method according to Claim 44, wherein said billet is heated to a temperature above the glass transition temperature of said polymer material.

46. A method according to Claim 42, wherein said drawing step further comprises the steps of drawing a first region of said billet to a first predetermined degree of said lengthwise plastic strain, and drawing a second region of said billet to a second predetermined degree of said lengthwise plastic strain, said second predetermined degree of said lengthwise plastic strain

being different from said first predetermined degree of lengthwise plastic strain.

47. A method according to Claim 43, wherein said expanding step further comprises the steps of radially expanding said first region to a first predetermined degree of said circumferential plastic strain and expanding said second region to a second predetermined degree of said circumferential strain, said second predetermined degree of said circumferential strain being different from said first predetermined degree of circumferential plastic strain.

48. A method according to Claim 43, further comprising the step of implanting said billet within said vessel, said expansion step occurring after said implanting step.

49. A method of treating a stenosis in a vessel, said method comprising the steps of:

supplying an elongated billet formed of a polymer material, said billet having been drawn lengthwise to establish a predetermined degree of lengthwise plastic strain therein, a lumen extending lengthwise along said billet having been formed therein;

positioning said billet within said vessel at said stenosis;

heating said billet; and

expanding said billet radially outwardly to open said stenosis.